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ABSTRACT

The role of the abstract triconsonantal root in the acquisition of Moroccan Arabic was investigated. Evidence from recorded speech samples of 32 Moroccan children between the ages of 3 and 6 is used to demonstrate that the abstract root plays a central role in both the nominal and verbal acquisition of the lexicon of Semitic languages and that the acquisition process follows a U-shaped developmental curve. A four-stage process for the acquisition of the Semitic lexicon is suggested, involving the use of patterns as amalgams, discovery of patterns, extraction of consonantal roots from patterns, and derivation of complex forms from basic forms. It is shown that the data fail to support Berman's (1981) assertions that the basic pattern is central in verbal derivation and that nouns are acquired as independent lexical items. Rather, verbal and nominal derivations are part of the same derivational process which has the morphological consonantal root as its central core. (RW)

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THE CENTRALITY OF THE ROOT IN SEMITIC LEXICAL DERIVATION:
Evidence from Children's Acquisition of Moroccan Arabic

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In Moroccan Arabic, a dialect of Standard Arabic, the lexicon, like that of other Semitic languages, is based on a system of underlying consonantal roots (usually triconsonantal) which are associated with an abstract semantic core. Most content words are formed by combining these roots with specific verbal and nominal patterns themselves associated with a particular meaning. For example, from the underlying roots F-H-M = 'understand' and M-L-K = 'possess', some words which can be derived are listed in tables 1 and 2:

Table 1. The verbal derivational system in Moroccan Arabic.

ROOT	PATTERN	FUNCTION	EXAMPLE	MEANING
F-H-M	<u>PI</u> C ₁ C ₂ eC ₃	MULTIPLE	FHeM	'he understood'
	<u>PII</u> C ₁ eC ₂ C ₂ eC ₃	CAUSATIVE	FeHHeM	'he explained'
	<u>PV</u> tC ₁ eC ₂ C ₂ eC ₃	REFLEXIVE	tFeHHeM	'he accepted an explanation'
	<u>PVI</u> tC ₁ A:C ₂ eC ₃	RECIPROCAL	tFa:HeM	'he reached a mutual understanding'
	<u>PVII</u> tteC ₁ C ₂ eC ₃	MEDIO-PASSIVE	tteFHeM	'it was understood'
S-F-R	<u>PIX</u> C ₁ C ₂ a:C ₃ (rare)	INCHOATIVE	SFa:R	'he became yellow' (pale)

* Numbering of patterns corresponds to the Classical Arabic system.

Table 2. Some frequent nominal patterns.

PATTERN	FUNCTION	EXAMPLE	MEANING
Ca:eC	AGENT	Ma:leK	'owner'
meCCu:C	PATIENT	meMLu:K	'owned'
CeCC	NOUN	MeLK	'property'
meCCaCa	PLACE N.	meMLaKa	'kingdom'
CeCCa:C	PROFESSION	MeLLa:K	'landlord'
CaCaCiy	ADJECTIVE	MaLaKiy	'royal'

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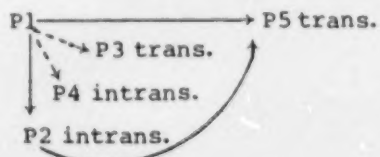
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In the verbal system Pl expresses a wide variety of semantic

functions and syntactic roles. It is therefore the most frequently used verbal pattern in Semitic languages and is usually referred to as the basic pattern in traditional grammars. As a result of its multifunctionality P1 is also predominant in child language.

Berman (1981) claims, based on her analysis of the Hebrew verbal derivation and using child language data as support, that 1) P1 plays a central role in the acquisition of the Hebrew verbal derivation, and 2) children develop a productive use of the verbal system only, while nouns are acquired as independent lexical items even though they may share the same underlying root with the derived verbs. According to Berman, when children begin to use the verbal system productively, i.e., by the fourth year, they have worked out the interrelationships between the verbal patterns along the lines presented in Model A below.

Model A. Interrelational network of the five Hebrew patterns.



SOURCE: Berman, 1981, p. 8.

(Broken lines indicate relatively unproductive connections.)

In this paper I will take issue with these two contentions and will show that Berman's analysis cannot account for reported developmental data in both Arabic and Hebrew lexical acquisition. My hypothesis is that the process of acquiring the lexicon of a Semitic language follows a U-shaped developmental curve similar to that suggested by Bowerman (1979) for the acquisition of English morphology, and that the abstract root rather than P1 plays a central role in the derivational process--both nominal and verbal. I shall suggest that the Semitic child in acquiring his lexicon goes through four main successive stages, of which the model proposed by Berman constitutes the last phase. The first stage consists of the use of patterns as amalgams (MacWhinney, 1978) whereby words are acquired as independent units. For the most part verbs used by the child are in the P1 form since it is the least 'specialized' form; it can be transitive or intransitive, and expresses several semantic notions such as causation, reflexivization, etc. Some other derived patterns are also used by the child at this stage, especially when they express frequent semantic notions, e.g., PII HeRReS = 'break'. The second stage is what I refer to as the 'pattern discover' phase. When the child begins a reanalysis of his lexicon, he notices, for example, that verbs expressing causation follow the same pattern, namely CeCCeC, and those expressing reciprocity the pattern tCa:CeC, and so on for all the frequent patterns in the input. The third stage is when the child is able to 'extract' the consonantal root from the patterns, or what I shall call 'vertical derivation'. The child reaches a stage where he sees that all words within a given semantic field share the same three consonants. This achievement, combined with his first pattern discovery, allows him to set up the root as the underlying core for the derivational process. The fourth stage in this developmental curve is the 'horizontal derivation' or Berman's (1981) interrelational

network. At this level (which is probably enhanced by literacy), the child is able to relate surface patterns and derive complex forms from the basic ones. These proposed developmental stages are illustrated in the following model.

Model B. Proposed stages of Semitic lexical derivation.

1. Amalgams: PI, PII, IVI, etc.
2. Pattern discovery: PI, PII, PVI, etc.
3. Vertical derivation:
(root discovery)

[ROOT]

PI PII PVI P nominals
4. Horizontal derivations:

PI → PII

PII → PVI

etc.

To support my claims I shall present evidence from Moroccan Arabic as well as from Hebrew data reported on by Berman (1980, 1981). The Arabic data to be discussed here come from a cross-sectional pilot study conducted in Casablanca, Morocco. Thirty-two middle-class Moroccan children between the ages of 3.5 and 6.2 were divided by age into three groups: 1) 3.5-4.2; 2) 4.5-5.1; 3) 5.4-6.2. Speech samples were collected for each child using the following procedures: 1.) Children were given experimental tasks aimed at eliciting verbal patterns expressing causative, reciprocal, and middle voice relations. In these tasks, nonce words were used to describe act-out sequences performed first by the examiner, then by the child on toy animals. The procedures followed in these tasks were based on Berko's (1958) wug test. 2.) Children also participated in a structured interview with the examiner. The purpose of this interview was to elicit the use of the same root in several derived patterns, by asking the child to describe daily activities at home such as early morning and mealtime routines. 3.) Children described pictures from a storybook about children at play. Pictures were selected to encourage the use of verbs in several derived patterns. All speech samples were audiorecorded and transcribed, yielding approximately 30 minutes of data per child.

RESULTS: Children in all three groups used more verb tokens than verb types. Most of the verb forms used were in the PI pattern. Some PII (causative), PVI (reciprocal), and PVII (medio-passive) were also used by all children. The distribution of verb types and percentages of verbal patterns for each age group is given in table 3. Since the number of verbs in each derived pattern was relatively small, all verbs in derived forms other than PI have been grouped together.

As table 3 indicates, PI was by far the most frequently used pattern in all three groups. In addition to verbal patterns, some derived participial forms which shared the same root with the produced verbs were also used by every child. Although the number and percentage of derived patterns increased with age, it was impossible to

Table 3. Distribution of derived patterns by age group.

	Total verb types	PI:Basic	%	P derived	%	PI--P _d	%	Parti- cipials
group 1 3.6-4.2	155	109	70	37	24	9	5	16
group 2 4.5-5.1	219	151	69	65	30	3	1	38
group 3 5.4-6.2	260	179	69	67	25	14	5	46
Totals:	634	439	69	169	27	26	4	102

determine from the data collected here, any order of acquisition. It appears, nonetheless, that reciprocals and medio-passives may be acquired earlier by Moroccan children than by Hebrew-speaking children (Berman, 1979). This decalage may be due to formal differences in input such as frequency of periphrastic constructions in Hebrew and more regular derivational verbal system in Moroccan Arabic.

The data from the act-out sequences show that children in group 1 (3.6-4.2) did not use the nonce forms at all; their strategy was to substitute real words in all their responses to the examiner's probes as in [1]:

- [1] Nonce form: KDeL = 'jumping up and down to keep warm' (E. demonstrates action and uses nonce PI KDeL, then asks S to perform action and say what he is doing to the animal toys)

Expected form: PII ka- n- KeDDeL
 Response: PII ka- n- SeXXeN (root = S-X-N)
 durative 1st per. warm (causative)
 = 'I am warming'

Children in groups 2 (4.5-5.1) and 3 (5.4-6.2) who responded with nonce forms followed two strategies. They either kept the nonce word in its PI form as in [2], or nominalized it as in [3]:

- [2] Nonce form in its citation PI form:

ka- n- KDeL
 dur. 1st per. KDeL PI
 = 'I am 'kdeling''

- [3] Nonce form nominalized:

gadi n- dir- lu le- KDeL
 will 1st per. do to him the kdel
 = 'I will do the kdel to him'

These examples show that none of the children used the nonce forms in a derived verbal pattern. This behavior suggests that they

may not be using PI as a starting point in their verbal derivations as proposed by Berman. Moreover, if Berman's derivational rule of PI to other patterns were indeed the strategy used by young children, one would expect them to have some overgeneralizations. In Moroccan Arabic, some high frequency verbs such as ĠSeL = 'wash' and MSeT = 'comb', several semantic relations are expressed by one pattern, i. e., PI, while verbs such as LBeS = 'dress' have these same semantic relations expressed by different patterns. Berman's model of pattern interrelationships would predict that, at least at an early stage of productive use of the derivational system, children would use, say, PII for all causatives once they have established the relation $PI \rightarrow PII$. This prediction is not borne out by the data, as examples [4] and [5] indicate:

- [4] a.

ka-	n-	ĠSeL	wežh-	i
dur.	1st per.	wash(PI)	face	my
= 'I wash my face'				
- b.

ka-	t-	ĠSeL	li	wežh-i
dur.	3rd per.	wash(PI)	for me	face my
= 'she washes my face'				
- but [5] a.

ka-	n-	LBeS	hwayž-	i
dur.	1st per.	wear(PI)	clothes	my
= 'I wear my clothes'				
- b.

ka-	t-	LeBBeS	li	hwayž-	i
dur.	3rd per.	dress(PII)	for me	clothes	my
= 'she dresses me'					

Although these examples do not necessarily show that children have a vertical derivation, they do indicate that the Moroccan children tested in this study do not operate with a surface rule of the sort proposed by Berman for Hebrew.

Additional evidence for the inadequacy of Berman's model comes from the errors of misformed patterns in the Arabic data and lexical innovations in Hebrew.

The Moroccan children in group 1 had several misformed patterns which were derived from weak roots. In weak roots, one radical is a semi-vowel Y or W which gets omitted from PI but reappears in some derived patterns. For example, from the root B-W-S = 'kiss', we get (PI) Ba:S = 'he kissed'; (PII) BeWWeS = 'he caused to kiss'. From the root T-Y-H = 'fall' etc. These weak verbs presented a particularly interesting window into the way Moroccan children may be acquiring their derivational rules. With weak roots, the child has to not only fit the consonantal roots in the appropriate slots of the patterns but has also to decide where the semi-vowel surfaces and where it does not. Errors of pattern misformation of the type illustrated in [6] and [7], hesitations, self-corrections, and repairs observed in the speech of children in group 1 support the interpretation that the child develops a strategy of vertical derivation which consists of establishing a direct relationship between the underlying consonantal

root and its different surface realizations in the form of patterns.

- [6] *ka- y- Ba:S- u cf. (PVI) ka-y-tBa:WS-u
 dur. 3rd per imp. kiss plu.
 = 'they are kissing each other'
 (this form was repaired as *ka- y- Ba:WS-u)
- [7] *ka- y- ^CeNQ- ha cf. (PII) ka-y- ^CeNNeQ-ha
 dur. 3rd per imp. hug her
 = 'he is hugging her'
 (this form was later repaired as *ka- y- N-^CeNQ-ha)

In [6], the child's first attempt to produce the reciprocal (PVI) kaytBa:WSu = 'they are kissing', the prefix t- and the semi vowel W are missing; in the repaired form, the semi vowel is produced but the prefix is still absent. In [7], the child seems to be aware of the doubling of the second consonant in the causative pattern, but when she attempts to repair her incomplete form she misplaces the N.

Hebrew data discussed in Berman (1980, 1981) included several lexical innovations which were either derivations of verbs from nouns as in [8] or nouns derived from verbal roots as in [9].

- [8] *šarvel (PI) = 'sleeve up'; from the noun šarvul = 'sleeve'
- [9] *maglexa = 'razor'; from the verbal root G-L-X = 'shave'

These innovations clearly show that the verbal and nominal derivations are part of one and the same derivational process, which has as its central core the semantic base represented by the morphological consonantal root.

I have attempted to show in this presentation that data from both Semitic languages, i.e., Arabic and Hebrew, do not support Berman's claim that PI is central in verbal derivation, nor are nouns acquired as independent lexical items. My argument that PI does not play a central role in the derivational process does not mean, however, that I am arguing against the special status accorded PI in the verbal system. PI is by far the most frequent, the simplest formally and semantically multifunctional. As a result, PI may very well be the first pattern to be analyzed by children and productively derived from the root.

CONCLUSION: Nominalized nonce forms and errors of misformed patterns in the Moroccan data, together with lexical innovations reported on by Berman, lend support to the hypothesis that when children begin to use the derivational system productively, they develop a strategy of vertical derivation and only later are they able to form horizontal interrelationships between surface patterns. This analysis has the advantages of 1) avoiding an arbitrary separation between verbal and nominal systems, and 2) allowing a generative process of word formation which is semantically based by positing the root as a real and productive construct in lexical derivation.

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